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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

AGUSTIN, PETER VINCENT

ART UNIT PAPER NUMBER

2652

DATE MAILED: 12/31/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/871,488

Applicant(s)

YEE, YOUNG JOO

Examiner

Peter Vincent M Agustin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 30 May 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: .

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DETAILED ACTION

Priority

1. Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d).

Drawings

2. The drawings are objected to because of the following informality:
Figures 5A and 5B: change "22" pointing towards the unshaded region to --2--.
A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

3. The disclosure is objected to because of the following informalities:
Page 4, paragraph 14, eighth line: delete excess spaces.
Page 6, paragraph 26, third line: delete "to" (with to the near field).
Page 6, paragraph 28, last line: delete comma before "primarily".
Page 7, paragraph 33, second line: change "9.74° off-axis with respect to (100) crystal" to --9.74° off-axis (100) with respect to crystal--.
Page 8, second line and all throughout the specification: part 111 (silicon crystal plane) is not labeled on the figures.
Terms "micro-mirror" and "micro mirror" used interchangeably throughout the text. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1, 5, 6, 11 & 17 rejected under 35 U.S.C. 102(b) as being anticipated by Knight (US-5881042).

Figure 6, items 138, 154 and the diagonal element disclose the “micro mirror”, “focusing lens” and “Solid Immersion Lens” of claim 1. The three items are shown to be parallel with each other, i.e., “the 45° mirror surface of the micro mirror, a focus plane of the focusing lens, and a focus plane of the SIL are aligned in parallel” (claim 6).

With regard to the manufacturing process limitations set forth in claims 5, 11 & 17 that the 45° mirror surface of the micro-mirror is formed by anisotropic etching by using one etchant selected from KOH, EDP & TMAH, it is noted that a “product by process” claim is directed to the product per se, no matter how actually made; see *In re Hirao*, 190 USPQ 15 at 17 (footnote 3, CCPA 1976); *In re Brown*, 173 USPQ 685 (CCPA 1972); *In re Luck*, 177 USPQ 523 (CCPA 1973); *In re Fessmann*, 180 USPQ 324 (CCPA 1974); *In re Thorpe*, 227 USPQ 964 (CAFC 1985). The patentability of the final product in a “product by process” claim must be determined by the product itself and not the actual process and an old or obvious product produced by a new method is not patentable as a product, whether claimed in “product by process” claims or not.

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Accordingly, the weight given to the "product by process" limitation is the structure "gleaned" from the process.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 7, 12, 13, 18 and 20 rejected under 35 U.S.C. 103(a) as being unpatentable over Knight in view of Kasono (US-6226238).

For a description of Knight, see the rejection, *supra*. Knight further discloses the "micro mirror", "focusing lens" and "Solid Immersion Lens" of claims 7 and 13 (see figure 6, items 138, 154 and the diagonal element). The three items are shown to be parallel with each other, i.e., "the 45° mirror surface of the micro mirror, a focus plane of the focusing lens, and a focus plane of the SIL are aligned in parallel" (claims 12 and 18). Knight, however does not disclose (a) first supporting frame and (b) second supporting frame of claims 7 and 13, (c) air-bearing surface of claim 13, and (d) "the SIL is fitted in the opening of the second supporting frame" (claim 20).

Kasono in the optical disk recording art discloses (see figure 2, items 9, 10, 11 and 14, column 3, lines 47-52 and lines 57-58) the "first supporting frame", "second supporting frame", and "SIL is fitted in the opening of the second supporting frame" in order to provide a holder for the objective lens and solid immersion lens. Column 3, line

57 teaches a "floating head" that "holds the SIL", i.e., the "air-bearing surface" of claim 13, in order to maintain the distance between the optical disk and the SIL.

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to have provided the "first supporting frame", "second supporting frame", "SIL is fitted in the opening of the second supporting frame" of Kasono to the apparatus of Knight. The motivation would have been: to provide a holder for the objective lens and the solid immersion lens with such an alignment as to further converge the light gathered by the objective lens to the solid immersion lens. Furthermore, it would have been obvious to provide the "air-bearing surface" of Kasono to the apparatus of Knight. The motivation would have been to make the supporting frame holding the solid immersion lens buoyant, thereby maintaining a constant distance between the optical disc and the SIL during recording.

8. Claims 2, 3, 8, 9, 14 and 15 rejected under 35 U.S.C. 103(a) as being unpatentable over Knight and Kasono as applied to claims 1, 7 and 13 above, and further in view of Jerman et al. (US-6061323).

For a description of Knight and Kasono, see the rejection, supra. Knight and Kasono remain silent as to the "mirror surface of the micro mirror has a highly reflective metal coating applied" (claims 2, 8 and 14), and "formed of a silicon substrate" (claims 3, 9 and 15).

Jerman et al. in the data storage art disclose using pure metals such as silver for the mirror layer (see column 12, lines 13-28), i.e., a "highly reflective metal coating" of claims 2, 8 and 14, in order to provide a mirror surface with high reflectivity. Column 7,

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lines 20-30 disclose a "silicon substrate" layer (claims 3, 9 and 15) in order to provide a suitable material for the micro mirror.

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to have provided the "highly reflective metal coating" and the "silicon substrate" of Jerman et al. to Knight and Kasono in order to provide a mirror surface with high reflectivity and a suitable material for the micro mirror.

9. Claims 4, 10 and 16 rejected under 35 U.S.C. 103(a) as being unpatentable over Knight, Kasono and Jerman et al. as applied to claims 3, 9 and 15 above, and further in view of Ohashi et al. (US-6487224).

For a description of Knight, Kasono and Jerman et al., see the rejection supra. It is not disclosed that the "substrate is a 9.74° off axis (100) silicon wafer" (claims 4, 10 and 16).

Ohashi et al. in the laser diode assembly art disclose "9.74-degree-off-angled silicon substrate" (claims 4, 10 and 16) in order to manufacture a mirror having 45 degrees with respect to the surface of the substrate (see column 1, lines 42-56 and figure 4A).

It would have been obvious to one of ordinary skill in the art at the time of invention by applicant to have provided the "9.74-degree-off-angled silicon substrate" of Ohashi et al. to Knight, Kasono and Jerman et al. The motivation would have been to obtain a mirror having 45° with respect to the surface of the substrate from a conventional silicon surface having a 54.74° angle with respect to the surface. It should be noted that the mirror surface of a conventional silicon substrate is known in the art to

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have an angle of 54.74° . The 9.74° off angle is used to compensate for the 54.74° angle to obtain a 45° mirror surface, e.g., $54.74 - 9.74 = 45$.

10. Claim 19 rejected under 35 U.S.C. 103(a) as being unpatentable over Knight and Kasono as applied to claim 13 above, and further in view of Knight et al (US-6243350).

For description of Knight and Kasono, see the rejection supra. Knight and Kasono do not disclose "the opening has a side surface sloped at a fixed angle such that an upper width thereof is greater than a lower width thereof" (claim 19).

Knight et al. in the optical storage art disclose "the opening has a side surface sloped at a fixed angle" (figures 5, 6 and 7) to provide alternative molding methods for an SIL.

It would have been obvious to one of ordinary skill in the art at the time of invention to have provided the sloped opening of Knight et al. to Knight and Kasono. The motivation would have been to: provide a mounting configuration that blocks the least amount of light passing through the SIL, thereby, increasing reflectivity.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Nakano et al. (US-6498776) disclose a near field light emitting element and an optical head, which near field light emitting element has a first film made of Al, an intermediate film made of SiN, and a second film made of Al on an emergent surface of a solid immersion lens made of a highly refractive material.

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Kobayashi (US-6434105) discloses an optical pickup device designed to reduce size, weight and cost and to increase the speed of an optical apparatus.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter Vincent M Agustin whose fax number is (703) 746-9788. The examiner can normally be reached on Monday thru Friday 9:00AM - 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hoa T Nguyen can be reached on (703) 305-9687. The fax phone number for the organization where this application or proceeding is assigned is (703) 305-3718.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Peter Agustin
12/22/2003


BRIAN D. MILLER
PRIMARY EXAMINER